DEPARTMENT OF TRANSPORTATION
ESC/OE MS #43
1727 30TH Street, 2ND Floor
Sacramento, CA 95816

April 2, 2001

03-Col-20-16.5/53.3
03-339004
ACNH-P020(127)E

Addendum No. 3

Dear Contractor:

This addendum is being issued to the contract for construction on State highway in COLUSA COUNTY AT VARIOUS LOCATIONS FROM 5.9 km WEST OF TEHAMA COLUSA CANAL BRIDGE TO MOON BEND ROAD.

Submit bids for this work with the understanding and full consideration of this addendum. The revisions declared in this addendum are an essential part of the contract.

Bids for this work will be opened on April 11, 2001.

This addendum is being issued to revise the Project Plans, the Notice to Contractors and Special Provisions, and the Federal Minimum Wages with Modification Number 1 dated 3-23-01. A copy of the modified wage rates are available for the contractor's use on the Internet Site:

http://www.dot.ca.gov/hq/esc/oe/weekly_ads/addendum_page.html

Project Plan Sheets 2, 11, and 36 are revised. A half-sized copy of the revised sheets are attached for substitution for the like-numbered sheets.

In the Special Provisions, Section 10-1.01, "ORDER OF WORK", the following paragraph added per Addendum No. 1 dated March 13, 2001 is deleted.

"The Cold Foam In-Place Recycling layer shall not be subjected to weekend traffic. By 3:00 p.m. on Fridays, the uppermost 50 mm layer of asphalt concrete surfacing shall be placed over the Cold Foam In-Place Recycling layer, and completed as shown on the plans."

In the Special Provisions, Section 10-1.11, "MAINTAINING TRAFFIC," is replaced as attached.

In the Special Provisions, Section 10-1.22, "COLD FOAM IN-PLACE RECYCLING," is replaced as attached.

In the Special Provisions, Section 10-1.23, "ASPHALT CONCRETE," Item B of the fifteenth paragraph is revised as follows:

"B. Pavement on horizontal curves having a centerline radius curve of 300 m or more but less than 600 m including the pavement within the superelevation transition of such curves, and pavement thicker than 45-mm total thickness placed on existing surfacing, shall have a Profile Index of 160-mm per kilometer or less for each 160-m section profiled."

03-Col-20-16.5/53.3
03-339004
ACNH-P020(127)E

In the Special Provisions, Section 10-1.23, "ASPHALT CONCRETE," Item B of the sixteenth paragraph is revised as follows:

B. Pavement with a total thickness of 45 mm or less, or pavement with extensive grade correction which does not receive advance leveling operations as specified in Section 39-10.03, "Spreading," in Section 11-1, "Quality Control / Quality Assurance," in these special provisions, or where the edge of asphalt concrete conforms to curbs or gutters with a Profile Index greater than 80 mm per kilometer.

In the Proposal and Contract, the Engineer’s Estimate Items 20 and 29 are revised, and Item 21 is deleted as attached.

To Proposal and Contract book holders:

Replace pages 3 and 4 of the Engineer's Estimate in the Proposal with the attached revised pages 3 and 4 of the Engineer's Estimate. The revised Engineer's Estimate is to be used in the bid.

Indicate receipt of this addendum by filling in the number of this addendum in the space provided on the signature page of the proposal.

Submit bids in the Proposal and Contract book you now possess. Holders who have already mailed their book will be contacted to arrange for the return of their book.

Inform subcontractors and suppliers as necessary.

This office is sending this addendum by UPS overnight mail to Proposal and Contract book holders to ensure that each receives it.

If you are not a Proposal and Contract book holder, but request a book to bid on this project, you must comply with the requirements of this letter before submitting your bid.

Sincerely,

ORIGINAL SIGNED BY

REBECCA D. HARNAGEL, Chief
Office of Plans, Specifications & Estimates
Division of Office Engineer

Attachments

10-1.11 MAINTAINING TRAFFIC

Attention is directed to Sections 7-1.08, "Public Convenience," 7-1.09, "Public Safety," and 12, "Construction Area Traffic Control Devices," and "Portable Changeable Message Sign," of the Standard Specifications and to the provisions in "Public Safety" of these special provisions and these special provisions. Nothing in these special provisions shall be construed as relieving the Contractor from the responsibilities specified in Section 7-1.09.

Lane and ramp closures shall conform to the provisions in section "Traffic Control System for Lane Closure" of these special provisions.

Personal vehicles of the Contractor's employees shall not be parked on the traveled way or shoulders including any section closed to public traffic.

The Contractor shall notify local authorities of the Contractor's intent to begin work at least 5 days before work is begun. The Contractor shall cooperate with local authorities relative to handling traffic through the area and shall make arrangements relative to keeping the working area clear of parked vehicles.

On Route 20, a portable changeable message sign shall be placed for each lane, shoulder, and ramp closure, in advance of the first warning sign as shown on the plans, unless otherwise directed by the Engineer. Where advanced warning signs in both directions are required, a portable changeable message sign shall be placed in advance of the first warning sign for each direction of travel.

On two-lane, two-way roadways, whenever vehicles or equipment are parked on the shoulder within 1.8 m of a traffic lane, the shoulder area shall be closed with fluorescent traffic cones or portable delineators placed on a taper in advance of the parked vehicles or equipment and along the edge of the pavement at 7.5 m intervals to a point not less than 7.5 m past the last vehicle or piece of equipment. A minimum of 9 cones or portable delineators shall be used for the taper. A C23 (Road Work Ahead) or C24 (Shoulder Work Ahead) sign shall be mounted on a portable sign stand with flags. The sign shall be placed where designated by the Engineer.

At all locations, a minimum of one paved traffic lane, not less than 3.0 m wide, shall be open for use by public traffic.

During construction operations, one-way traffic control will be permitted for periods not to exceed 10 minutes. After each closure, accumulated traffic shall pass through the work before another closure is made. When traffic is under one-way traffic control, delays to public traffic shall not exceed 20 minutes.

At location 4, except as noted herein, lanes shall be closed only during the hours shown on the chart included in this section "Maintaining Traffic." Except work required under Sections 7-1.08 and 7-1.09, work that interferes with public traffic shall be performed only during the hours shown for lane closures.

The maximum length of any lane closure shall be limited to 1.6 km for the asphalt concrete (Type A) paving work, and to 4 km for the open-grade asphalt concrete (OGAC) paving work and for cold foam in-place recycling (CFIPR) work. All other closures shall be limited to 1.6 km.

At location 1, the Contractor shall complete all grinding and placement of the cold foam in-place recycling (CFIPR) work (including temporary delineation and signing) in one direction before beginning any work in the opposing direction.

At location 2, the Contractor shall notify the Engineer 7 calendar days prior to a ramp closure. The Contractor shall furnish and erect advance notice signs as shown on the plans a minimum of 3 calendar days prior to the actual closure. A portable changeable message sign shall be placed before the ramp closure takes place. When ramps are closed, public traffic shall be detoured to the preceding/next ramp or as directed by the Engineer. When portable changeable message signs are no longer required, they shall be removed as directed by the Engineer. When no longer required, the advance notice signs shall be covered or removed as directed by the Engineer.

At location 2, only one ramp at a time shall be closed, unless directed by the Engineer.

Furnishing, erecting, maintaining, and removing special portable detour signs (SC3) along the detour route for ramp closure will be paid for as extra work as provided in Section 4-1.03D of the Standard Specifications.

At locations 1, 2, and 3, except as noted herein, the full width of the traveled way shall be open for use by public traffic on Saturdays, Sundays, the day preceding designated legal holidays, designated legal holidays, after 3:00 p.m. on Fridays, and when construction operations are not actively in progress.

Designated legal holidays are: January 1st, the third Monday in February, the last Monday in May, July 4th, the first Monday in September, November 11th, Thanksgiving Day, and December 25th. When a designated legal holiday falls on a Sunday, the following Monday shall be a designated legal holiday. When November 11th falls on a Saturday, the preceding Friday shall be a designated legal holiday. When a designated legal holiday falls on a Monday, the full width of the traveled way shall be open for use by public traffic on the preceding Friday, Saturday and Sunday.

Minor deviations from the requirements of this section concerning hours of work which do not significantly change the cost of the work may be permitted upon the written request of the Contractor if, in the opinion of the Engineer, public traffic will be better served and the work expedited. These deviations shall not be adopted by the Contractor until the Engineer has approved the deviations in writing. Other modifications will be made by contract change order.

Chart
Two-Lane Conventional Highway Lane Requirements

Direction: EASTBOUND/WESTBOUND Location 4: 03-COL-20-KP 51.3/53.8

FROM HOUR TO HOUR	a.m. 12	1	2	3	4	5	6	7	8	9	10	11	p.m. 12	1	2	3	4	5	6	7	8	9	10	11	12
Mondays through Thursdays	R	R	R	R	R	R	R	R	R	2	2	2	2	2	2	2	2	2	R	R	R	R	R	R	
Fridays	R	R	R	R	R	R	R	R	R	2	2	2	2	2	2	2	2	2	R	R	R	R	R	R	
Saturdays	R	R	R	R	R	R	R	R	R	R	R														
Sundays																									
Day before designated legal holiday and designated legal holidays																									

Legend:

R	A minimum of one paved traffic lane, not less than 3.4 m wide shall be open for use by public traffic. (Reversing Control).
2	A minimum of two paved traffic lanes (not less than 3.67 m wide per lane in each direction of travel) shall be open for use by the public traffic.
	No closure allowed.

REMARKS:

10-1.22 COLD FOAM IN-PLACE RECYCLING

Cold Foam In-Place Recycling shall consist of the following:

A. Mill and reuse materials in the upper layers of the existing roadway structural section;
B. Change the grading of the existing materials by the addition of imported aggregate base if and where necessary;
C. Procure, furnish, and mix in a combination of foamed bitumen and cementitious stabilizing agents together with sufficient water to approximate the optimum moisture content; and
D. Place and compact to achieve a new structural section, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

MATERIALS

In-situ Material

A summary of in-situ investigations is available to Contractors in the “Materials Information” handout. The handout may be obtained from the Office of the District Director of Transportation at the North Region Construction Office at 379-A Colusa Highway, Yuba City, California 95991.

Where it is necessary to modify the grading of the material in the existing structural section, aggregate base and cement shall be spread on the existing roadway surface prior to recycling, as determined by the Engineer.

Imported Aggregate Base

Aggregate base shall be imported and Class 2, 19-mm maximum grading, and shall conform to the provisions in Section 26-1.02A, “Class 2 Aggregate Base,” of the Standard Specifications. Section 26-1.03, "Subgrade," through Section 26-1.05, "Compacting," of the Standard Specifications shall not apply.

Cementitious Stabilizing Agent

Portland cement shall be the only cementitious stabilizing agent employed in the cold foam in-place recycling process. Portland cement shall conform to the provisions in Section 90-2.01, “Portland Cement,” of the Standard Specifications. Section 90-1.01, "Description," and Section 90-2.02, "Aggregates," through Section 90-11.02, "Payment," of the Standard Specifications shall not apply.

Bituminous Stabilizing Agent

Foamed bitumen shall be the only bituminous stabilizing agent employed in the cold foam in-place recycling process. Foamed bitumen shall be produced from a bitumen (also referred to as "asphalt") and shall conform to the provisions in Section 92, “Asphalts,” of the Standard Specifications. The grade of asphalt binder to be mixed with the cold foam in-place recycled material shall be AR4000.

Water

Water shall be clean and free from deleterious concentrations of acids, alkalis, salts, sugar and other organic or chemical substances.

PLANT AND EQUIPMENT

General

All plant and equipment shall be supplied and operated in such a manner as to cold recycle the existing structural section material to the depth as shown on the plans and to construct a new structural section in a single pass. Plant and equipment employed shall be of adequately rated capacity and in good working order. Obsolete, poorly maintained, or dilapidated plant and equipment shall not be allowed on the job site.

Plant for Cold Foam In-Place Recycling

Cold foam in-place recycling shall be performed by utilizing a modified milling or recycling machine to mill, to the depth shown on the plans, the material in the upper layers of the existing structural section together with any imported aggregate base and to achieve the required grading and consistency of mixing a single pass. The recycled material shall exit from the mixing chamber in a manner that prevents particle segregation. Spreading and placing to form the new structural section shall be by motor grader or screed mounted on the rear of the recycling machine.

The modified milling or recycling machine shall be a Wirtgen Model WR2500, Caterpillar Model RR350, or equal, and, as a minimum, shall have the following features:

A. A minimum power capability of 600 horsepower;
B. Where the recycling depth exceeds 250 mm, the effective volume of the mixing chamber shall be increased in relation to the depth of cut;
C. Two microprocessor controlled systems, complete with 2 independent pumping systems and spraybars, to regulate the application of foamed bitumen stabilizing agent, separate from water (for increasing the moisture content of the recycled material), in relation to the forward speed and mass of the material being recycled;
D. Two spraybars shall each be fitted with self-cleaning nozzles at a maximum spacing of one nozzle for each 155 mm width of the chamber;
E. The foamed bitumen shall be produced at the spraybar in individual expansion chambers into which both hot bitumen and water are injected under pressure through individual and separate small orifices that promote atomization. The rate of addition of water into hot bitumen shall be kept at a constant (percentage by mass of bitumen) by the same microprocessor;
F. An inspection (or test) nozzle shall be fitted at one end of the spraybar that produces a representative sample of foamed bitumen;
G. An electrical heating system capable of maintaining the temperature of all bitumen flow components above 150°C;
H. A single bitumen feed pipe installed between the modified milling or recycling machine and the supply tanker. Circulating systems that incorporate a return pipe to the supply tanker shall not be used;
I. The operator cabin shall be variable from right to left;
J. A printer shall be included to record amounts of materials used.

Rollers

Compaction of the newly placed structural section material shall be achieved by means of self-propelled vibratory and pneumatic-tired rollers. The frequency and amplitude of vibrating rollers shall exceed a static mass of 15 tonne and shall be adjustable.

Supply Tankers for the Bituminous Stabilizing Agent

Only tankers with a capacity exceeding 10 000 L shall be used to supply the recycling machine with bitumen. Each tanker shall be fitted with two recessed pin-type tow hitches, one in front and the other behind, thereby allowing the tanker to be pushed from behind by the recycling machine, and to push a water tanker in front. No leaking tanker will be permitted on the job site. In addition, each tanker shall be equipped with the followings:

A. A thermometer to show the temperature of the contents in the bottom third of the tank;
B. A rear feed valve, with a minimum internal diameter of 75 mm, capable of draining the contents of the tank when fully opened;
C. All-round cladding to retain heat;
D. A heating system capable of raising the temperature of the contents in the tank by at least 20°C per hour; and
E. A calibrated dipstick marked at intervals of no more than 100 L, for measuring the contents of the tank.

CONSTRUCTION LIMITATIONS AND REQUIREMENTS

Weather Limitations

No cold foam in-place recycling work shall be performed during wet conditions, nor started without completing before the wet conditions set in. No recycling work shall be performed if the ambient air temperature is below 5°C. Other than the finishing and compaction operations, no work will be allowed if the air temperature drops below 10°C.

Spreading of cementitious stabilizing agents on the roadway ahead of the recycling machine will not be allowed when windy conditions adversely affect the operation.

Determination of In-situ Moisture Content

The contractor shall test the existing structural section to be recycled for the in-situ moisture content using California Test 226. A line of samples shall be extracted for testing at 2.0 m intervals across the roadway width every 500 m and where there is a known change in the material in the existing structural section. Samples shall be taken at a depth of 100 mm below bottom of the asphalt concrete layer.

Moisture content tests shall not be performed more than one week in advance of the recycling process. Samples shall be representative of the in-situ material. Test results shall be provided to the Engineer within 48 hours of sampling.

In-situ moisture data will be used by the Engineer to determine exact application rates for cement and aggregate base.

Time Limitations

The maximum time period between mixing the recycled material with a stabilizing agent and compacting the placed material shall be determined by the type of stabilizing agent applied. Where combination of two or more different stabilizing agents are used, the time limitation shall be dictated by the stabilizing agent that predominates. Where portland cement is added in conjunction with a bituminous stabilizing agent at an application rate of less than 2 percent, the time limit of the bituminous stabilizing agent shall apply.

The maximum time periods shall be as follows:

Stabilizing Agent	Time Limit
Portland Cement	3 hours
Foamed bitumen	24 hours if kept moist

Production Plan

Prior to begin the recycling work each day, the Contractor shall prepare a production plan detailing proposals for the forthcoming day's work. The production plan shall contain the followings:

A. A sketch showing the overall layout of the length and width of roadway intended for recycling during the day, broken into the number of parallel cuts required to achieve the stated width, and the overlap dimensions at each joint between cuts;
B. The sequence and length of each cut to be recycled before starting on the adjacent or following cut;
C. An estimate of the time required for milling, mixing, and compacting the cut. The sketch shall also show the time when the completion of each is expected;
D. The location where samples were taken for determining in-situ moisture contents, and the results of the tests;
E. The proposed water addition for each cut, and the location the change is to be made within that sequence;
F. The quantity and location from where the aggregate base are imported;
G. The amount and type of stabilizing agent, or agents, to be applied to each cut;
H. The proposed control testing program; and
I. Any other information that is relevant for the intended work.

Longitudinal joints shall be planned to coincide with each and every change in cross-slope, regardless of the implications on overlap width.

Surface Preparation

Before any recycling work begins, the surface of the existing roadway to be recycled shall be prepared by:

A. Clearing all vegetation and other foreign matter from the entire roadway width, including any adjacent lanes or shoulders that are not to be recycled;
B. Removing all standing water; and
C. Accurately premarking the proposed longitudinal cut lines on the existing roadway surface.

Profile and Cross Slope Requirements

Details of the profile and cross-slope requirements for the recycled roadway surface will be provided by the Engineer. The profile and cross slope shall match the existing conditions.

Cementitious Stabilizing Agents

A uniform layer of powdered cementitious stabilizing agents shall be spread on the prepared roadway surface prior to milling.

The dry stabilizing agents shall be spread uniformly over the full width of roadway to be recycled prior to each pass of the recycling machine, either by means of a mechanical spreader at the prescribed rate of application in a continuous process, or by hand.

Bituminous Stabilizing Agents

Bituminous stabilizing agents shall be added to the milling or recycling process by pumping from a mobile bulk tanker that is pushed from behind by the recycling machine.

Tankers shall be equipped with a built-in thermometer and heating facilities to ensure that the bituminous stabilizing agent is maintained at 180°C $\pm$ 5°C.

Bitumen that has been heated above 220°C shall not be used for producing foamed bitumen and shall be removed from the site.

The system employed to add a foamed bitumen stabilizing agent to the cold foam in-place recycling process shall conform to the requirements specified in "Plant for Cold Foam In-Place Recycling" of these special provisions.

The Contractor shall verify bituminous stabilizing agent (asphalt) usage quantities by measuring tanker volume every 300 linear meters recycled. At the end of each workday the measurements shall be reported to the Engineer.

A one-liter sample of bituminous stabilizing agent shall be taken from each tanker load and submitted to the Engineer for testing.

Moisture Content Control for Recycled Material

Sufficient water shall be added during the recycling process to meet the moisture requirements specified below. Water shall be added only by means of the microprocessor control system on the recycling machine and care shall be taken to prevent excessive wetting.

Any portion of the work that becomes too wet will be rejected and the Contractor shall correct the moisture content by drying out and reprocessing the material, together with fresh stabilizing agent (only where cementitious stabilizing agent is employed as the principal stabilizing agent). Corrective work shall be at the Contractor's expense.

At the time of compaction, the moisture content of the recycled material can be determined as follows, depending on the principal type of stabilizing agent employed:

1) When cementitious stabilizing agents are used:

The moisture content during compaction shall not exceed 75 percent of the saturation moisture content of the natural material without the stabilizing agent, calculated at Maximum Dry Density.

The moisture content at the specified degree of saturation can be determined as follows:

$$W_v = (S_r)\left(\frac{X_w}{X_d} - \frac{1000}{G_s}\right)$$

Where:

W_v = Moisture content of the material at the specified degree of saturation in percent

S_r = Specified degree of saturation in percent

X_w = Density of water in kg/m^3

X_d = Maximum dry density of the natural material in kg/m^3

G_s = Apparent density of the material in kg/m^3

2) When non-cementitious stabilizing agents are used and material recycled without stabilizing agents:

The moisture content during compaction shall not exceed the optimum moisture content, nor shall it be more than 2 percent below the Optimum Moisture Content.

The recycling machine shall be set up and operated to ensure the following requirements are met:

Grading of the Recycled Material

The forward speed of the recycling machine, rotation rate of the milling drum, and the positioning of the gradation control beam shall be set to break down the in-situ material to 100 percent passing the 37 mm sieve.

The contractor shall take all necessary steps to ensure that the grading of the recycled material conform to the requirements specified in "Demonstration Sections" of these special provisions.

Addition of Water and Foamed Bitumen Stabilizing Agent

The microprocessor control system for the addition of water and foamed bitumen shall be set and carefully monitored to meet the required compaction moisture and stabilizer content.

Bulk bitumen tankers shall be dipped at the end of each cut in order to determine actual usage against the calculated theoretical demand.

Control of Cut Thickness

The actual depth of cut shall be physically measured at both ends of the milling drum at least once every 100 m along the cut length.

Overlap on Longitudinal Joints

To ensure complete recycling across the full width of the road, longitudinal joints between successive cuts shall overlap a minimum of 50 mm.

The premarked cut lines marked on the road surface shall be checked to ensure that the width of the first cut is equal to that of the milling drum and that the width of all the successive cuts shall be narrower than the drum width by at least 50 mm. The recycling machine shall be steered so as to accurately follow the premarked cut lines. Any deviation in excess of 50 mm shall be rectified immediately by reversing to where the deviation commenced and reprocessing along the correct line, without the addition of any further water or stabilizing agent.

The overlap width shall be confirmed before starting each new cut sequence and any adjustments made to ensure that the amount of water and fluid stabilizing agent to be added is reduced proportionately by the width of the overlap.

Continuity of Stabilized Layer

The contractor shall ensure that there is no gap of unrecycled material created between successive cuts (along the same longitudinal cut line), nor any untreated wedges created by the entry of the milling drum into the existing material.

The exact location at which each cut terminates shall be carefully marked. This mark shall coincide with the position of the center of the milling drum at the point at which the supply of stabilizing agent ceased.

To ensure continuity of the stabilized layer the next successive cut shall begin at least 0.5 m behind this mark.

Subgrade Instability

Where subgrade instability is encountered during the recycling process, the subgrade shall be:

A. Excavated and removed to a depth of 600 mm; and
B. Replaced and backfilled with Class II Aggregate Base.

Backfill shall be placed in layers of 150 mm or less after compaction and followed by successive layers until the level of the existing road is reached.

Subgrade instability and removal shall be determined as directed by the Engineer. Removal of subgrade instability will be paid for as extra work as provided in Section 4-1.03D of the Standard Specifications.

Level and Shape Control

Processed material shall be spread to fill the cut void. Such spreading shall be achieved either by a screed attached to the rear of the recycling machine, or by a motor grader following behind. Care shall be exercised while spreading to prevent undue segregation.

To prevent the final surface from tearing and scarring, the level and cross-sectional shape requirements shall be addressed prior to the material receiving the full compactive effort. The required surface levels and shape may be achieved by either:

A. Presetting the paving screed mounted at the rear of the machine, or
B. Cutting with a motor grader, or
C. Using both methods.

Compaction

After placing and shaping, the compacted recycled material shall have a relative compaction of not less than 98 percent as measured by California Test 231. Rolling shall commence as soon as it is practical, and shall follow the predetermined sequence specified in “Demonstration Sections” of these special provisions.

Watering, Finishing and Curing

After compaction, the roadway surface shall be treated with a light application of water, and rolled with pneumatic-tired rollers to create a close-knit texture.

The finished surface of the recycled layer shall be kept continuously damp by frequent light watering. The tack coat shall not be applied to the surface until the moisture content of the recycled layer is at least 2 percent below the saturation moisture content.

The finished layer shall be free from:

A. Surface laminations,
B. Segregation of fine and coarse aggregate, and
C. Corrugations or any other defects that may adversely affect the performance of the layer.

TEST STRIP START UP PROCEDURES

The Contractor shall assemble all items of plant and equipment for the recycling operation on the first day of the CFIPR work. The Contractor shall construct a test strip for the project at a location approved by the Engineer. The test strip section shall be recycled to:

A. Demonstrate that the equipment and processes can produce recycled layers to meet the requirements specified in these special provisions;
B. Determine the effect on the grading of the recycled material by varying the forward speed of the recycling machine and the rotation rate of the milling drum; and
C. Determine the sequence and manner of rolling necessary to obtain the minimum compaction requirements.

The test strip shall be at least 100 m in length of a full lane-width or a half-road width.

The Contractor shall repeat the test strip process until parameters of the material properties conform to the requirements specified herein and as directed by the Engineer. The repeated process of the test strip shall be done at the Contractor's expense. The corrective method shall be determined by the Contractor, as directed by the Engineer.

PROTECTION AND MAINTENANCE

The Contractor shall protect and maintain the recycled layer until the next layer or surfacing is applied. Frequent light watering shall be performed to prevent the surface from drying out. Any damage or defects in the layer shall be repaired immediately. An even and uniform surface shall be maintained.

Repairs and maintenance for the recycled layers shall be done at the Contractor's expense.

CONSTRUCTION TOLERANCES

The completed recycled layer shall comply with the construction tolerances set forth in these special provisions.

Surface Levels

The surface levels of the finished recycled layer shall not vary by more than 10 mm above or below the surface levels determined from the grade and cross-section details established by the Engineer.

Layer Thickness

A lot size shall be at least 20 mm layer thickness measurements. The lot will comply with the requirements specified if it meets the following tolerances:

A. D_{90} is greater than or equal to 20 mm, that is, at least 90 percent of all thickness measurements are equal to or thicker than the specified thickness, minus 20 mm;
B. D_{mean} is greater than or equal to $D_{spec} - (D_{spec}$ divided by 20), that is, the mean layer thickness for the lot shall not be less than the specified layer thickness, minus the specified layer thickness divided by twenty; and
C. $D_{max} < 30$ mm, that is, no individual layer thickness measurement shall be less than the specified thickness minus 30 mm.

Cross-section

When tested with a 3 m straightedge laid at right angles to the centerline of the road, the surface shall not deviate from the bottom of the straightedge by more than 10 mm.

At any cross section, the difference in level between any two points shall not vary from their difference in level computed from the required cross-section by more than l5 mm.

ROUTINE INSPECTION AND TESTS

Prior to opening the roadway to traffic at the end of the day's work, an inspection will be undertaken and routine tests made by the Engineer to determine whether the quality of material and workmanship provided complies with the requirements set forth in “Demonstration Sections” and in “Protection and Maintenance” of these special provisions.

MEASUREMENT AND PAYMENT

Cold foam in-place recycling will be paid for by the square meter. The area to be paid for will be calculated on the basis of the dimensions shown on the plans adjusted by the amount of any change ordered by the Engineer. Cold foam in-place recycling done outside those dimensions will not be measured or paid for unless otherwise ordered by the Engineer.

The contract price paid per square meter for cold foam in-place recycling shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all the work involved in cold foam in-place recycling, complete in place, including preparation of the existing roadway surface, supplying and applying water for mixing, placing and compacting the material, reworking all material in overlapping adjacent cuts regardless of the number of cuts or width of overlap necessary to cover the full road width, protection and maintenance of the recycled layer, and conducting all process and acceptance control inspections, measurements and tests, furnishing, placing, maintaining, and removing C6 (Loose Gravel) and W6 (35 MPH) signs and temporary supports or barricades for the signs, as shown on the plans, as specified in the standard specifications and these special provisions, and as directed by the Engineer.

Aggregate base (cold foam in-place recycling) will be measured by the tonne.

The contract price paid per tonne for aggregate base (cold foam in-place recycling) shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in applying aggregate base, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Bitumen (cold foam in-place recycling) will be measured by the tonne in the same manner specified for asphalt in Section 92-1.05, "Measurement," of the Standard Specifications.

The contract price paid per tonne for bitumen (cold foam in-place recycling) shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in applying asphalt binder, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Cement (cold foam in-place recycling) will be measured by the tonne.

The contract price paid per tonne for cement (cold foam in-place recycling) shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in applying cement, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

ENGINEER'S ESTIMATE
03-339004

Item	Item Code	Item	Unit of Measure	Estimated Quantity	Unit Price	Item Total
1	070010	PROGRESS SCHEDULE (CRITICAL PATH)	LS	LUMP SUM	LUMP SUM	
2	070018	TIME-RELATED OVERHEAD	WDAY	120		
3	074019	PREPARE STORM WATER POLLUTION PREVENTION PLAN	LS	LUMP SUM	LUMP SUM	
4	074020	WATER POLLUTION CONTROL	LS	LUMP SUM	LUMP SUM	
5 (S)	120090	CONSTRUCTION AREA SIGNS	LS	LUMP SUM	LUMP SUM	
6 (S)	120100	TRAFFIC CONTROL SYSTEM	LS	LUMP SUM	LUMP SUM	
7 (S)	128650	PORTABLE CHANGEABLE MESSAGE SIGN	LS	LUMP SUM	LUMP SUM	
8	129000	TEMPORARY RAILING (TYPE K)	M	110		
9 (S)	129100	TEMPORARY CRASH CUSHION MODULE	EA	84		
10	150662	REMOVE METAL BEAM GUARD RAILING	M	230		
11	150722	REMOVE PAVEMENT MARKER	EA	4020		
12	150771	REMOVE ASPHALT CONCRETE DIKE	M	2810		
13	151224	REMOVE DELINEATOR	EA	210		
14 (S)	151572	RECONSTRUCT METAL BEAM GUARD RAILING	M	1200		
15	152402	ADJUST WATER VALVE COVER TO GRADE	EA	11		
16	152439	ADJUST FRAME AND GRATE TO GRADE	EA	8		
17	152440	ADJUST MANHOLE TO GRADE	EA	3		
18 (S)	020553	COLD PLANE ASPHALT CONCRETE PAVEMENT (50 MM MAXIMUM)	M2	2720		
19 (S)	020554	COLD PLANE ASPHALT CONCRETE PAVEMENT (70 MM MAXIMUM)	M2	3010		
20 (S)	153155	COLD PLANE ASPHALT CONCRETE PAVEMENT (75 MM MAXIMUM)	M2	27 200		

ENGINEER'S ESTIMATE
03-339004

Item	Item Code	Item	Unit of Measure	Estimated Quantity	Unit Price	Item Total
21 (S)	BLANK					
22 (S)	020556	COLD PLANE ASPHALT CONCRETE ASPHALT (95 MM MAXIMUM)	M2	71 100		
23	153210	REMOVE CONCRETE	M3	10		
24	156579	REMOVE BRIDGE RAILING	M	61		
25	190101	ROADWAY EXCAVATION	M3	72		
26	198007	IMPORTED MATERIAL (SHOULDER BACKING)	TONN	20 200		
27	020557	AGGREGATE BASE (COLD FOAM IN-PLACE RECYCLING)	TONN	400		
28	020558	COLD FOAM IN-PLACE RECYCLING	M2	137 000		
29	390152	ASPHALT CONCRETE	TONN	36 800		
30	390165	ASPHALT CONCRETE (OPEN GRADED)	TONN	2630		
31	391031	PAVING ASPHALT (BINDER-PAVEMENT REINFORCING FABRIC)	TONN	130		
32	393001	PAVEMENT REINFORCING FABRIC	M2	104 000		
33	394002	PLACE ASPHALT CONCRETE (MISCELLANEOUS AREA)	M2	460		
34	394042	PLACE ASPHALT CONCRETE DIKE (TYPE B)	M	300		
35	394044	PLACE ASPHALT CONCRETE DIKE (TYPE C)	M	220		
36	394048	PLACE ASPHALT CONCRETE DIKE (TYPE E)	M	1480		
37	394049	PLACE ASPHALT CONCRETE DIKE (TYPE F)	M	870		
38	397001	ASPHALTIC EMULSION (PAINT BINDER)	TONN	210		
39	020559	BITUMEN (COLD FOAM IN-PLACE RECYCLING)	TONN	2230		
40	020560	CEMENT (COLD FOAM IN-PLACE RECYCLING)	TONN	670		